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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,936	08/27/2003	Li Zou	2620P	8078

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EXAMINER	
LEUNG, WAI LUN	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/650,936	ZOU ET AL.	
	Examiner	Art Unit	
	Danny Wai Lun Leung	2613	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

Drawings

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 6-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 6 recites the limitation "the transmission port" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim. Since claim 1 recites 4 different transmission ports, one of ordinary skill in the art would not know which transmission port is the claim referring to.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-14, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Number 6,744,986 to Vohra, in view of US Patent Number 5,943,149 to Cearns et al.

Regarding to claim 16, Vohra teaches an upgradeable optical add/drop module *(30, fig 5)*, comprising:

an optical input *(input of WDM 38, fig 5)* and an optical output *(76, fig 5)*;

a demultiplexer section *(WDM 38, fig 5)*; and

a multiplexer section *(WDM 78, fig 5)*.

Vohra further teaches wherein each of the transmission ports of the demultiplexer *(16, fig 5)* are optically coupled to the transmission ports of the multiplexer *(72, fig 5)*.

Vohra does not disclose expressly the details regarding the multiplexer section and the demultiplexer section.

Cearns, from the same field of endeavor, teaches a configuration of optical multiplexer/demultiplexer, wherein the optical demultiplexer comprises:

a first bandpass filter *(20, fig 5)* with a first pass band *(λ_1-λ_8)* and optically coupled to the optical input *(col 5, ln 23-29)*, comprising a first reflection port *(on the left)* and a first transmission port *(on the right)*,

a first cascaded series of channel filter assemblies *(the series of filter shown on the right of fig 5)* optically coupled to the first transmission port *(outputting λ_1-λ_8, fig 5)*,

a third bandpass filter *(the first filter on the series of filters shown on left of fig 5)* with a second pass band *(λ_{11}-λ_{16})* and optically coupled to the first reflection port *(optically coupled to the left side port of 20 as shown in fig 5)*, comprising a third transmission port *(on the right)*, and

a third cascaded series of channel filter assemblies *(the remaining series of 5 filters as shown on the left of fig 5)* optically coupled to the third transmission port,

wherein the first bandpass filter separates a composite optical input signal into a first subset of channels *(λ_1-λ_8)* and a second subset of channels *(λ_{10}-λ_{16})*, wherein the first subset of channels is transmitted to the first cascaded series of channel filter assemblies via the first transmission port and the second subset of channels is reflected to the third bandpass filter via the first reflection port *(col 5, ln 25-29)*,

wherein the third bandpass filter separates the second subset of channels *(λ_{10}-λ_{16})* into a third subset of channels *(λ_{11}-λ_{16})* and a fourth subset of channels *(λ_{10})*, wherein the third subset of channels is transmitted to the third cascaded series of channel filter assemblies via the transmission port *(as shown in fig 5)* and the fourth subset of channels is reflected from the third bandpass filter *(Cearns also describes in col 5 ln 51-col 6 ln 11 that numerous other embodiments with other numbers of subsets of channels may also be*

implemented, where the filtering, transmitting, and reflecting of the third bandpass filter may be performed with similar fashion to that of the first bandpass filter, emphasis on col 5, ln 54-62).

Cearns further teaches that multiplexing can be performed with the same invention with corresponding components *(col 2, ln 65-67)*, since filter performs the same function for light traveling in the opposite direction *(col 2, ln 33-35).*

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to use Cearns' demultiplexer and multiplexer; wherein the demultiplexer comprises the first bandpass filter, the first cascaded series of channel filter assemblies, the third bandpass filter, and the third cascaded series of channel filter assemblies as discussed above; and the multiplexer comprises corresponding components, such as a second bandpass filter, a second cascaded series of channel filter assemblies, a fourth bandpass filter, and a fourth cascaded series of channel filter assemblies onto Vohra's system, such that Vohra's upgradeable optical add/drop module, comprises: an optical input and an optical output, a demultiplexer section, and a demultiplexer section; wherein the de-multiplexer section, comprising:

a first bandpass filter with a first pass band and optically coupled to the optical input, comprising a first reflection port and a first transmission port, a first cascaded series of channel filter assemblies optically coupled to the first transmission port, a third bandpass filter with a second pass band and optically coupled to the first reflection port, comprising a third transmission port, and a third cascaded series of channel filter assemblies optically coupled to the third transmission port, wherein the first bandpass filter separates a composite optical input signal into a first subset of channels and a

second subset of channels, wherein the first subset of channels is transmitted to the first cascaded series of channel filter assembles via the first transmission port and the second subset of channels is reflected to the third bandpass filter via the first reflection port, wherein the third bandpass filter separates the second subset of channels into a third subset of channels and a fourth subset of channels, wherein the third subset of channels is transmitted to the third cascaded series of channel filter assemblies via the transmission port and the fourth subset of channels is reflected from the third bandpass filter;

the multiplexer section, comprising:

a second bandpass filter with the first pass band and optically coupled to the optical output, comprising a second reflection port and a second transmission port, a second cascaded series of channel filter assembles optically coupled to the second transmission port, a fourth bandpass filter with the second pass band and optically coupled to the second reflection port, comprising a fourth transmission port, and a fourth cascaded series of channel filter assemblies optically coupled to the fourth transmission port, wherein each channel of the first subset of channels is transmitted to an assembly of the second cascaded series of channel filter assemblies, wherein the second cascaded series of channel filter assemblies transmit the first subset of channels to the second bandpass filter via the second transmission port, wherein each channel of the third subset of channels is transmitted to an assembly of the fourth cascaded series of channel filter assemblies, wherein the fourth cascaded series of channel filter assemblies transmit the third subset of channels to the fourth bandpass tilter via the fourth transmission port, wherein the fourth bandpass filter combines the third subset of channels, wherein the

third subset of channels is transmitted to the second bandpass filter via the second reflection port, wherein the second bandpass filter transmits the first subset of channels and reflects the third subset of channels, wherein the first and third subsets of channels are combined into a composite optical output signal as taught by the combination of Vohra and Cearns.

The motivation for doing so would have been to apply the advantage of Cearns's WDM demultiplexer and multiplexer, in which closely spaced channels can be separated and combined using conventional dichroic filters, onto Vohra's OADM system such that channel spacing can be improved.

Claims 1, 3-14, and 17 are rejected for the same reasons as stated above regarding claim 16, because the recitations of the combined teachings of Vohra and Cearns as discussed above reads on the claimed limitations of claims 1, 3-14, and 17, where Cearns' teaching of optical multiplexer/demultiplexer using bandpass filters and cascaded series of channel filter assemblies are applied to Vohra's OADM system with respective transmission ports communicating the respective channels. Cearns' fig 5 also explicitly show that the cascaded series of channel filter assemblies transmit one channel of the subset of channels and reflects other channels of the subset, as recited in claims 5, 7, 10, and 12. It would have been obvious to combine Vohra and Cearns for the same reason as stated regarding claim 16.

As to claim 2, Vohra further teaches the module of claim 1, further comprising an optical switching unit *(12, fig 5)* optically coupled between the demultiplexer *(38, fig 5)* and the multiplexer *(78, fig 5)*, where the first and third cascaded series of channel filter assemblies is in the demultiplexer *(38)*, and the second and fourth cascaded series of channel filter assemblies is

in the multiplexer *(78), as taught by Cearns in the combined teaching of Vohra and Cearns*, such that Vohra's optical switching unit *(12)* is between the first and second cascaded series of channel filter assemblies, and between the third and fourth cascaded series of channel filter assemblies *in the combined teaching of Vohra and Cearns.*

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Number 6,744,986 to Vohra, in view of US Patent Number 5,943,149 to Cearns et al., applied to claim 1 as discussed above, and further in view of applicant's admitted prior art fig 3.

Regarding to claim 15, the combination of Vohra and Cearns discloses the module of claim 1 as discussed above. Cearns further discloses wherein at least one of the channel filter assemblies comprises a plurality of optical fibers and GRIN lenses *(col 2, ln 49-52)*.

The combination does not disclose expressly wherein at least one of the channel filter assemblies comprises: a first capillary tube comprising a plurality of optical fibers; a second capillary tube comprising at least one optical fiber; a first quarter pitch GRIN lens optically coupled to the first capillary tube; a second quarter pitch GRIN lens optically coupled to the second capillary tube; and an optical fiber optically coupled to the first and second GRIN lenses.

Applicant's admitted prior art fig 3, from the same field of endeavor, teaches that it is common and well known that a channel filter assemblies may comprise:

a first capillary tube *(302a)* comprising a plurality of optical fibers *(308, 310)*;

a second capillary tube *(302b)* comprising at least one optical fiber *(312)*;

a first quarter pitch GRIN lens *(304a)* optically coupled to the first capillary tube;

a second quarter pitch GRIN lens *(304b)* optically coupled to the second capillary tube; and

an optical filter *(306)* optically coupled to the first and second GRIN lenses.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to recognized that, although not explicitly shown, at least one of Cearns' channel filter assemblies *(fig 5)* may comprise a first capillary tube comprising a plurality of optical fibers *(for example, the fiber that is carrying channels λ_{10}-λ_{16} in fig 5 of Cearns may be comprised of a first capillary tube as suggested by the prior art figure)*; a second capillary tube comprising at least one optical fiber *(for example, the fiber that is carrying channel λ_{11} in fig 5 of Cearns may be comprised of a second capillary tube as suggested by the prior art figure)*; a first quarter pitch GRIN lens optically coupled to the first capillary tube *(the first filter from the top in the filter assemblies filtering λ_{10}-λ_{16} in fig 5 of Cearns may comprise a first capillary tube that is coupled to a GRIN lens as suggested by the prior art figure)*; a second quarter pitch GRIN lens optically coupled to the second capillary tube *(the second filter from the top in the filter assemblies filtering λ_{11}-λ_{16} in fig 5 of Cearns may comprise a second capillary tube that is coupled to a GRIN lens as suggested by the prior art figure)*; and an optical fiber optically coupled to the first and second GRIN lenses *(the fiber that is optically coupled to the first two filters in the filter assemblies of Cearns, where the two filters comprises the first and second GRIN lenses)*. The motivation for doing so would have been to recognize that GRIN lens helps focus and collimate optical signals, while capillary tube helps protect the fiber, therefore GRIN lens and capillary tube are essential to any channel filter assemblies such as that of Cearns', as used in the combination of Vohra and Cearns.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Danny Wai Lun Leung whose telephone number is (571) 272-5504. The examiner can normally be reached on 9:30am-7:00pm Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DWL
September 8, 2006

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER